

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF MISSOURI  
EASTERN DIVISION**

AMERICAN AUTOMOBILE	)	
INSURANCE COMPANY as assignee	)	
of FRED AND ADRIENNE KOSTECKI	)	
	)	
Plaintiff	)	
	)	
v.	)	Case No. 4:11CV00305AGF
	)	
OMEGA FLEX, INC., a Pennsylvania	)	
Corporation	)	
	)	
Defendant.	)	

**DEFENDANT OMEGA FLEX, INC.’S  
MEMORANDUM IN OPPOSITION TO PLAINTIFF’S MOTION FOR NEW TRIAL**

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## **INTRODUCTION**

AAIC's Motion for New Trial asserts that the District Court made two evidentiary errors: the exclusion of certain testimony of AAIC's metallurgical expert, Thomas W. Eagar; and the admission of certain testimony of Omega Flex's mechanical engineering and fire causation expert, Harri Kytomaa. Specifically, AAIC claims the Court should have permitted Dr. Eagar to offer an opinion that the design of TracPipe was defective—in addition to his opinions on metallurgy, arc physics, and fire causation, all of which the Court permitted. AAIC further claims the Court should have precluded Dr. Kytomaa's opinions 1) that the lightning energy that reached the CSST line was dissipated to the extent that it would not have been sufficient to penetrate the CSST; and 2) challenging the bases and conclusions of Dr. Eagar's "metallurgical" opinions. (Pl. Mem. at 6).

The Court permitted Dr. Eagar, over Omega Flex's objection, to testify to his opinions regarding fire causation. The Court properly determined, however, that Dr. Eagar's attempt to testify that TracPipe's design was "defective" or "inadequate" exceeded the scope of his expertise. He admits that he is not an expert on design, and courts have precluded his similar opinions. Moreover, his design opinion is unsupported, simply based on a series of assertions without any scientific support or authority.

In contrast to Dr. Eagar, Dr. Kytomaa is eminently qualified in the areas in which he testified: mechanical engineering, fire causation, and the analysis of thermal and flow processes. His expertise in thermodynamics and fluid mechanics—established by his testing and publications in those areas—formed the basis of his fire causation opinions that refuted Dr. Eagar's speculative fire causation opinion.

The Court was entirely correct in its decision to limit Dr. Eagar's testimony and permit Dr. Kytomaa's testimony; AAIC's motion simply seeks a result that would permit Dr. Eagar to offer unqualified, speculative testimony and deprive Omega Flex the opportunity to offer competent, supported testimony to challenge Dr. Eagar's opinions.

### **STATEMENT OF FACTS**

Prior to trial, the parties filed extensive *Daubert*<sup>1</sup> briefing relating to Dr. Eagar and Dr. Kytomaa. (Doc. Nos. 51, 52, 53 (Omega Flex Eagar motion, mem., and exhibits); 69 (Pltf. mem. in resp.); 79 (Omega Flex reply)); (Doc. Nos. 63, 64, 65, 66 (Pltf. Kytomaa motion, mem., and exhibits); 75 (Omega Flex mem. in resp.); 83 (Pltf. reply); 85 (Omega Flex surreply); 86 (Pltf. surresponse)). On April 3, 2013, the motions were argued for nearly two hours before the Court. On June 11, 2013, the Court issued a 32-page Memorandum and Order on the parties' *Daubert* motions and motions for summary judgment, devoting nine pages to the *Daubert* motions, and five pages solely to Dr. Eagar's opinions. (Doc. No. 96, Mem. and Order, at 11-15).

The Court permitted Dr. Eagar to testify to matters within his proffered areas of expertise—metallurgy and arc physics—and to offer his opinion regarding fire causation in relation to metallurgy and arc physics (Doc. No. 96, Mem. and Order, at 15); however, the Court found AAIC had failed to show that Dr. Eagar qualified as an expert with respect to product design and product warnings to provide a reliable basis for his opinions on those issues. (Doc. No. 96, Mem. and Order, at 13).<sup>2</sup> As to Dr. Kytomaa, the Court concluded that Dr. Kytomaa's "expertise in fire causation and electrical engineering has been duly demonstrated and his opinions regarding the cause of the fire are supported by scientific literature and the testing he performed." (Doc. No. 96, Mem. and Order, at 17).

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<sup>1</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993).

<sup>2</sup> AAIC does not dispute the propriety of the Court's preclusion of Dr. Eagar's testimony regarding warnings.

## **ARGUMENT**

### **A. STANDARD OF REVIEW**

“The determination to grant a new trial rests within the discretion of the trial court.” *Carraway v. Christian Hosp. Ne./Nw.*, No. 4:03CV1077, 2006 U.S. Dist. LEXIS 61832, \*3 (E.D. Mo. Aug. 30, 2006). “Although the Court has discretion to set aside the jury verdict and grant a new trial, it ‘may not do so merely because it believes that the evidence permitted different inferences or that another result would be more reasonable.’” *Id.* at \*4 (quoting *Blake v. J.C. Penney Co.*, 894 F.2d 274, 281 (8th Cir. 1990)). “The burden of demonstrating that error warrants a new trial rests with the moving party.” *Id.* (citations omitted). “The Court’s ultimate inquiry is whether the first trial resulted in a miscarriage of justice.” *Id.*; *Harris v. Secretary, U.S. Dep’t of Army*, 119 F.3d 1313, 1318 (8th Cir. 1997)

Likewise, “[d]ecisions concerning the admission of expert testimony lie within the broad discretion of the trial court, and these decisions will not be disturbed on appeal absent an abuse of that discretion.” *Littleton v. McNeely*, 562 F.3d 880, 891 (8th Cir. 2009); *Miles v. Gen. Motors Corp.*, 262 F.3d 720, 724 (8th Cir. 2001) (“Admission of expert testimony is committed to the broad discretion of the trial court.”). Moreover, “[e]ven if the district court’s evidentiary decision were an abuse of discretion, any error ‘must affect a party’s substantial rights to warrant a new trial.’” *Id.* at 891 (citation and quotations omitted).

### **B. THE COURT PROPERLY PRECLUDED DR. EAGAR FROM GIVING UNQUALIFIED, SPECULATIVE OPINION TESTIMONY ON ISSUES OF DESIGN DEFECT**

#### **1. The Court’s Preclusion of Dr. Eagar’s Design Opinion Was a Proper Exercise Of Its Gatekeeping Function**

It is well established that under Federal Rule of Evidence 702, an expert is only permitted to offer testimony within the bounds of his qualifications, not opinions “outside of his area of

expertise.” *See, e.g., Khoury v. Philips Med. Sys.*, 614 F.3d 888, 893 (8th Cir. 2010); *Weisgram v. Marley Co.*, 169 F.3d 514, 520-21 (8th Cir. 1999) (metallurgist was not expert in product design and testing); *Kennedy v. Baxter Healthcare Corp.*, 348 F.3d 1073, 1074-75 (8th Cir. 2003) (affirming exclusion of expert who was not physician or toxicologist from opining “what makes a rubber glove safe or unsafe for allergy purposes”); *Wheeling Pittsburgh Steel Corp. v. Beelman River Terminals, Inc.*, 254 F.3d 706, 715-16 (8th Cir. 2001) (hydrologist not qualified to testify about safe warehousing practices).

Further, Rule 702’s relevancy prong “requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility.” *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 592 (1993). Where there is “too great an analytical gap between the data and the opinion proffered,” the expert’s opinion must be excluded. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997). “[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.” *Id.*

Finally, to meet *Daubert*’s reliability prong, the proponent of expert testimony must show that the testimony is based on “sufficient facts or data,” that it is “the product of reliable principles and methods,” and that those methods have been “reliably” applied to the “facts of the case.” Fed. R. Evid. 702 & advisory committee’s note (2000); *Daubert*, 509 U.S. at 592-93. In other words, the expert’s opinions must be “derived by the scientific method” and “supported by appropriate validation – *i.e.*, ‘good grounds,’ based on what is known.” *Daubert*, 509 U.S. at 590. Under Rule 702 and *Daubert*, “any step that renders the analysis unreliable under the *Daubert* factors renders the expert’s testimony inadmissible.” *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 745 (3d Cir. 1994) (emphasis added).

Dr. Eagar's proffered testimony in the area of product design was beyond the scope of his expertise, lacked a sufficient relationship to his areas of expertise, and lacked a reliable basis. (See Doc. No. 96, Mem. and Order, at 13). While the Court permitted Dr. Eagar to opine on areas within his qualifications—namely, metallurgy, arc physics, and fire causation—the Court properly exercised its gatekeeping function by not permitting Dr. Eagar to venture into the area of CSST design. Not only does Dr. Eagar admit he is not an expert in product design, but, even without that admission, the Court properly excluded his opinions in those areas as speculative and unreliable.

## **2. The Court Properly Relied On Dr. Eagar's Admissions That He Is Not An Expert On Design**

AAIC's motion details Dr. Eagar's qualifications that it claims qualified him to discuss the adequacy of TracPipe's design.<sup>3</sup> These qualifications were all before the Court at the pretrial *Daubert* hearing, and the Court, after reviewing thousands of pages of briefing and exhibits, disagreed with AAIC. Specifically, the Court noted that Dr. Eagar "has specifically disavowed such expertise and his areas of expertise bear no more than a remote relationship to product design and warnings." (Doc. No. 96, Mem. and Order, at 13). Therefore, the Court determined that Dr. Eagar's testimony on those subjects would not assist the jury. The Court additionally cited concerns of relevance and prejudice, in that the "shroud of his irrelevant expertise in another area will likely elevate his opinion above a mere observation to a legal conclusion." (Doc. No. 96, Mem. and Order, at 14 (internal alterations and citations omitted)).<sup>4</sup>

<sup>3</sup> Although AAIC characterizes Dr. Eagar's excluded design opinions as involving Omega Flex's "material selection for TracPipe" and the "failure characteristics of the metal used in TracPipe" (AAIC Mem. at 7; *id.* at 8), in reality, Dr. Eagar's design opinion is simply that TracPipe is "too thin."

<sup>4</sup> This Court is not alone in precluding Dr. Eagar from testifying on the subjects of product design and warnings. (Doc. No. 96, Mem. Op., at 13, citing *Cincinnati Ins. Co. v. Omega Flex, Inc.*, No. 3:10-CV-00670M, 2013 WL 2120322 (W.D. Ky. May 15, 2013)); *More, JB, Inc. v. Nutone, Inc.*, 2007 WL 4754173, at \*4 (W.D. Tex. Mar. 21, 2007) ("Eagar's [sic] lack of expertise in the manufacture or design of small motors precludes him from offering the opinion that the use of an additional TCO is a commercially feasible alternative design.").

Dr. Eagar has conceded that he is not an expert in the design of corrugated stainless steel systems or the design and installation of residential electrical or gas systems. (Doc. No. 52-6, 10/25/12 T. Eagar Dep. (Sauer) at 198:15-18; Doc. No. 54-4, 4/29/10 T. Eagar Dep. (Grimm) at 81:18-82:20; Mem. and Order at 12 n.4). As Omega Flex established prior to trial, he has never designed a CSST system for application in a residence, a commercial building, or any other building, and has never published any articles on the design or installation of a CSST system. (Doc. No. 52-6, 10/25/12 T. Eagar Dep. (Sauer) at 197:23-198:14, 200:7-11; Mem. and Order at 12 n.4). Nor has Eagar ever designed a lightning protection system, worked in a company that specialized in lightning protection, or conducted a study on how a lightning protection system works. (Doc. Nos. 54-2, 10/25/11 T. Eagar Dep. (Karlin) at 24:14-16, 24:20-23; 52-5, 7/11/11 T. Eagar Dep. (Becnel) at 27:21-28:3; 52-4, 10/13/10 T. Eagar Trial Test. (Tincher) at 346:8-12). This Court's determination, therefore, was entirely in accordance with the Eighth Circuit's decision in *Weisgram* to exclude similar design testimony, because a metallurgist does "not have the necessary experience . . . to be qualified" to testify that a product failed "because it was defectively designed or manufactured." 169 F.3d at 520-21. Indeed, just as the Eighth Circuit determined with regard to the metallurgist in *Weisgram*, this Court determined that Dr. Eagar was "qualified as an expert in the properties of metals," and yet such expertise did *not* qualify the expert to offer *design-defect* testimony. 169 F.3d at 520.

### **3. The Court Correctly Determined That Eagar's Design Opinions Lacked a Reliable Basis**

Separate and apart from Dr. Eagar's admitted lack of expertise, the Court properly excluded his testimony on TracPipe's design, because it was scientifically unsupported and unreliable. As AAIC concedes in its motion, Dr. Eagar spoke in general terms of how CSST "can fail" and that CSST is "more likely" to sustain damage from arcing. (AAIC. Mem. at 9).

For example, Eagar asserted that black iron pipe is safer than CSST in the lightning context because it allegedly is involved in fewer house fires. Eagar admits, however, that he is not aware of “any articles indicating that black iron pipe is a safer alternative to CSST” and that he has “not published any articles regarding [his] opinion that black iron pipe is a safer alternative to CSST.” (Doc. No. 52-6, 10/25/12 T. Eagar Dep. (Sauer) at 206:17-24; *see also* Doc. No. 54-9, 10/15/10 T. Eagar Dep. (Yahia) at 122:24-123:7 (relying on anecdotal observations rather than data). Nor does he dispute that only a small minority – one-fifth to one-third – of lightning/gas fires involve homes with CSST; the vast majority of fires involve homes with different piping systems. (Doc. No. 54-5, 6/8/12 T. Eagar Suppl. Rpt. at 18). Instead, his report asserted – counterfactually and based on the deposition of a single employee – that only 500,000 homes have CSST and thus the failure rate for CSST is higher than for black iron pipe. (*Id.*; Doc. No. 54-2, 10/25/11 T. Eagar Dep. (Karlin) at 108:3-109:8). However, that employee was providing an *estimate* as of 2008 based on the number of feet of CSST sold, rather than *actual data* regarding the number of homes with CSST as compared to homes with black iron pipe – data that Eagar does not cite. Nor did Dr. Eagar even consider—much less provide—any estimate of the error rate of his calculation or analysis, as required by the *Daubert* standards of NFPA 921. (Doc. No. 52-10, NFPA 921 at 11.5.2.3.6(b)(3)). “[O]pinions formulated merely upon general observations of the evidence and general scientific principles [are] unreliable.” *Presley v. Lakewood Eng'g & Mfg. Co.*, 553 F.3d 638, 646 (8th Cir. 2009); *see, e.g., Nebraska Plastics, Inc. v. Holland Colors Am., Inc.*, 408 F.3d 410, 416-17 (8th Cir. 2005) (excluding expert who “failed to take into account a plethora of specific facts” that undermined conclusion).

Under these circumstances, the Court simply did not commit any error—much less an abuse of its broad discretion—in determining that AAIC failed to show that Dr. Eagar’s

qualifications would have allowed him “to provide a reliable basis for his opinions on [product design].” (Doc. No. 96, Mem. and Order, at 13).

**4. AAIC Failed to Make an Offer of Proof at Trial as to the Substance of Dr. Eagar’s Design Opinion and, Thereby, Waived Any Challenge to the Court’s Preclusion of That Opinion**

The Court had ample evidence from which it concluded that Dr. Eagar’s design defect opinion could not meet *Daubert*’s standards for admissibility. However, AAIC waived any possible error it could have raised by failing to make an offer of proof at trial as to Dr. Eagar’s specific proffered testimony.

“One of the most fundamental principles in the law of evidence is that in order to challenge a trial court’s exclusion of evidence, an attorney must preserve the issue for appeal by making an offer of proof.” *Trinity Prods., Inc. v. Burgess Steel, LLC*, No. 4:03CV01808, 2006 WL 903241, \*6 (E.D. Mo. Apr. 7, 2006) (quoting *Dupre v. Fru-Con Engineering, Inc.*, 112 F.3d 329, 336 (8th Cir. 1997)). “The Eighth Circuit has held that “[e]ven if an issue is raised pre-trial . . . an attorney must make an offer of proof during the trial in order to preserve the issue for appeal.” *JCB, Inc. v. Union Planters Bank, N.A.*, No. 4:03CV01355, 2007 WL 2317542, \*10 (E.D. Mo. Aug. 9, 2007) (quoting *United States v. Echols*, 346 F.3d 818, 820 (8th Cir. 2003), *rev’d on other grounds*, 539 F.3d 862; *Littleton*, 562 F.3d at 891 (“Error may not be predicated upon a ruling excluding evidence unless . . . the substance of the evidence was made known to the court by offer [of proof] or was apparent from the context within which the questions were asked.”) (citation and quotations omitted).

Nowhere in the transcript of Dr. Eagar’s trial testimony does AAIC make such an offer of proof as to exactly what Eagar’s design defect opinion would have been. (*See* excerpt of Trial Tr., July 9, 2013, attached as Exhibit A). As the Eighth Circuit has made clear, AAIC was

obligated to make an offer of proof during the trial. *See Echols*, 346 F.3d at 820. “The purpose of the offer of proof is to allow both the trial court and the appellate court on review to ascertain whether excluding the evidence caused any prejudice to the appellant.” *JCB*, No. 4:03CV01355, 2007 WL 2317542, at \*10. While AAIC asserts general error in the Court’s preclusion of Dr. Eagar’s design defect opinion, based upon the Court’s *Daubert* ruling, AAIC failed to make its record to establish exactly what Dr. Eagar’s testimony would have been and whether it would have been reliable based on his qualifications and any relationship to his areas of expertise. Accordingly, just as in *JCB*, AAIC’s “failure to make offers of proof has precluded the Court from now reaching any reasoned conclusion that the exclusion of the evidence materially prejudiced” AAIC. *Id.*

**C. THE COURT PROPERLY ALLOWED DR. KYTOMAA TO OFFER RELIABLE TESTIMONY WITHIN HIS AREA OF EXPERTISE TO CHALLENGE DR. EAGAR’S FIRE CAUSATION OPINIONS**

Just as the Court concluded from the *Daubert* papers, AAIC’s objections to Dr. Kytomaa’s opinions are vague and generalized criticisms. While AAIC mischaracterizes Dr. Kytomaa’s opinions as pertaining to “the metallurgical characteristics of TracPipe” (Pl. Mem. at 12), the true allegation of error pertains to Dr. Kytomaa’s opinions “that the CSST was the victim of fire attack, that gas escaping from an arc-induced hole in the CSST cannot be ignited and that bonding would have prevented this fire” (Pl. Mem. at 13). It is clear from Dr. Kytomaa’s qualifications that he was eminently qualified to offer those opinions, which fall squarely within his areas of expertise: mechanical engineering, thermodynamics, and fluid mechanics. Moreover, as the Court permitted Dr. Eagar to testify on fire causation—an area better suited for Dr. Kytomaa’s specific area of expertise—Dr. Kytomaa undisputedly possesses the expertise, research, and practical experience to enable him to testify as to flaws in Dr.

Eagar's fire causation opinions.

**1. Dr. Kytomaa's Background And Qualifications**

As Omega Flex demonstrated prior to trial, Dr. Kytomaa is the Director of the Thermal Sciences practice at Exponent and has focused his academic and professional career in mechanical engineering, fire causation, and the analysis of thermal and flow processes. (Doc. Nos. 75-1, H. Kytomaa CV at 1; 75-2, 10/11/12 H. Kytomaa Dep. at 18:12-19 ("Our practice is the practice that specializes in fires and explosions.")). Dr. Kytomaa holds a M.S. and a Ph.D. in Mechanical Engineering from the California Institute of Technology, where he studied fluid dynamics. (Doc. No. 75-1, H. Kytomaa CV at 1). Dr. Kytomaa served as a professor at MIT for eight years, where he taught courses in thermodynamics and fluid mechanics, and is a Registered Professional Mechanical Engineer in seven states. (Doc. Nos. 75-2, 10/11/12 H. Kytomaa Dep. at 23:4-12; 75-1, H. Kytomaa CV at 2). Dr. Kytomaa also testified that he has specific training and experience in metallurgy both "through [his] course work" and "in [his] own engineering practice over many years." (Doc. No. 69-35, 10/11/12 H. Kytomaa Dep. at 31:23-32:3).

Unlike Dr. Eagar, who offered fire causation testimony despite having *no* qualifications in the area of fire causation, Dr. Kytomaa is a Certified Fire and Explosion Investigator with the National Association of Fire Investigators National Certification Board, a Certified Fire Investigator with the International Association of Arson Investigators, and a recipient of a Fire Investigation 1A Certification from the California State Fire Marshall. (Doc. Nos. 75-1, H. Kytomaa CV at 2; 75-2, 10/11/12 H. Kytomaa Dep. at 17:16-23). In his work as a fire causation expert, Dr. Kytomaa has investigated hundreds of fires. (Doc. No. 75-2, 10/11/12 H. Kytomaa Dep. at 17:4-9).

Dr. Kytomaa has also conducted extensive research and authored numerous publications, including numerous articles on fire causation, fire investigation, ignition, and natural gas transportation—all of which formed the bases of his opinions. (Doc. No. 75-1, H. Kytomaa CV at 2-6). Among other things, Dr. Kytomaa recently published an article entitled *Lightning Related Structural Fires* in the International Symposium on Fire Investigation Science and Technology, instructing other fire investigators on investigative techniques “to consider when investigating an apparent lightning-caused residential fire.” (Doc. No. 75-3, Andrew D. Ellison, et al, *Lightning Related Structure Fires*, International Symposium on Fire Investigation Science and Technology (“ISFI”) (October 2012), at 1). This article addresses many of the same matters discussed in Dr. Kytomaa’s expert report, including the fact that “[t]he household electrical system is a common victim of lightning discharges,” and that an “indirect lightning strike which deposits even a fraction of the lightning strike’s energy into the household electrical system can cause significant damage to system components and appliances.” (*Id.* at 9).

## **2. AAIC Established No Basis To Criticize Dr. Kytomaa’s Opinions In This Case**

As Omega Flex established in its *Daubert* papers, Dr. Kytomaa analyzed and opined to the specific facts and circumstances of *this case*, which demonstrated that the Kostecki fire was not caused by a failure or defect in the house’s CSST system. Because the Court permitted Dr. Eagar to opine to fire causation over Omega Flex’s objection, despite his admitted lack of qualifications as a fire causation expert, AAIC’s claim of error in permitting Dr. Kytomaa—a fire causation expert—to challenge and refute Dr. Eagar’s opinions is simply untenable. The available evidence, which Dr. Kytomaa analyzed, demonstrates that the fire likely was caused by a failure in the Kostecki’s household electrical system, which then discharged electrical energy and perforated the CSST *after* the fire had already started. (Doc. No. 52-3, 5/4/12 H. Kytomaa

Rpt. at 54-55). Dr. Kytomaa bases his conclusion on numerous record facts that AAIC's expert Thomas Eagar ignores and on testing that Dr. Kytomaa performed that more closely replicated the conditions in the Kostecki residence.

As Dr. Kytomaa explains, the lightning in the vicinity of the Kostecki residence was an indirect strike, approximately fifty feet from the structure – not a *direct* lightning strike as Dr. Eagar assumes. The energy to which a house is exposed from an indirect strike is lower than that found in a direct strike and “is significantly dissipated by the time that it makes it to the home.” (Doc. No. 75-4, 10/17/12 H. Kytomaa Dep. at 102:17-23 (“[I]f you have an indirect strike to a home, the energy is significantly dissipated by the time that it makes it to the home.”); Doc. No. 52- 3, 5/4/12 H. Kytomaa Rpt. at 49 (“in the event of an indirect lightning strike, only a fraction of the strike current will enter the residence”)). Accordingly, only a fraction of the current from lightning measured in the vicinity of the Kostecki residence would have flowed to the Kostecki residence, and only a portion of that amount would flow to the CSST system, with the remaining energy taking other possible paths to ground, resulting in a charge that was insufficient to perforate the TracPipe under Dr. Eagar's own calculations. (Doc. No. 52-3, 5/4/12 H. Kytomaa Rpt. at 49-50).

AAIC criticizes Dr. Kytomaa's opinion that the fire at the Kostecki residence was caused by lightning-induced damage to household components that preceded the holes in TracPipe. AAIC's claim that this opinion is “speculative” or otherwise inadmissible ignores materials that AAIC itself cited, which establish that energy from a lightning strike indeed can cause electrical faults – as Dr. Kytomaa opines here. (*Id.* at 18). AAIC's criticism also ignores the extensive and undisputed evidence demonstrating that the household electrical system at the Kostecki residence was *in fact* damaged by the fire. It is undisputed, for example, that five of the eleven sets of

circuit wires retained from the Kostecki house showed evidence of electrical activity, three of which were located near the CSST system. (*Id.* at 36-38). It is also undisputed that the circuit breaker in the Kostecki household was tripped, which occurs when there is an “overcurrent condition” that often occurs during a fire, such in the event of arcing with an electrical wire. (Doc. No. 75-2, 10/11/12 H. Kytomaa Dep. at 113:8-15).

AAIC offers similar criticism of Dr. Kytomaa’s opinion that, even if the lightning strike here had sufficient energy to perforate TracPipe, the gas escaping from the piping would not have ignited under the conditions present at the Kostecki residence. (Doc. No. 75-2, 10/11/12 H. Kytomaa Dep. at 113:8-15. The flaw in AAIC’s argument, however, is that the fact that the temperature of molten metal may in the abstract theoretically be sufficient to ignite gas under specific scenarios does not mean that a lightning-induced perforation in TracPipe could have caused ignition of gas *under the circumstances at the Kostecki residence*—and it certainly does not preclude Dr. Kytomaa from rendering an opinion contrary to the position of AAIC and Dr. Eagar. As Dr. Kytomaa explained, whether gas will ignite by hot surface ignition depends not only upon the temperature of the ignition site but upon a number of specific circumstances, including the gas velocity, gas concentration, and exposed area of the hot surface. (Doc. Nos. 52-3, 5/4/12 H. Kytomaa Rpt. at 50-51; 75-14, 10/5/12 H. Kytomaa Suppl. Rpt. at 4-5). Not only is this opinion well within Dr. Kytomaa’s expertise in thermodynamics and fluid mechanics, it also is supported by scientific literature, which demonstrates that it is not possible to ignite natural gas under certain combinations of these variables. (Doc. No. 75-15, Normand Laurendeau, *Thermal Ignition of Methane-Air Mixtures by Hot Surfaces: A Critical Examination*, Combustion and Flame (1982), at 29 (cited in Doc. No. 52-3, 5/4/12 H. Kytomaa Rpt. at 51). As Dr. Kytomaa notes based on his own testing, gas does not ignite under conditions

similar to those that would be found in the Kostecki home, and AAIC does not cite any published example of any experiment to the contrary.<sup>5</sup> (Doc. No. 75-4, 10/17/12 H. Kytomaa Dep. at 138:13-20).

Finally, AAIC claims Dr. Kytomaa was unqualified to testify that bonding would have prevented the Kostecki fire. Like all of AAIC's criticisms, this one assumes that Dr. Eagar's opinions are correct, to the exclusion of all other opinions; however, it fails to cite any facts, data, or analysis to support that position or explain how Dr. Kytomaa—an expert in engineering science with specific experience in the consequences of inadequate bonding and grounding of equipment, the principles of electrical charge accumulation and electric discharges and lightning-related structure fires—lacks the qualifications or basis to opine as to the efficacy of bonding. As Dr. Kytomaa explained in his expert report, direct bonding lowers the electrical impedance between TracPipe (or other piping systems) and the house's grounding electrode – *i.e.*, equalizes the voltage between the TracPipe and other grounded conductors. (Doc. Nos. 52-3, 5/4/12 H. Kytomaa Rpt. at 20-21; 75-4, 10/17/12 H. Kytomaa Dep. at 159:1-12). This in turn “significantly reduce[s] the likelihood of perforation of TracPipe due to lightning induced arcing,” as electrical arcs are more likely to occur when there is high voltage between a piping system and other conductors. (Doc. No. 52-3, 5/4/12 H. Kytomaa Rpt. at 20-21). In other words, direct bonding reduces differences in voltage between conductors in the event any remaining energy from a lightning strike enters the house and also lowers the likelihood that the energy can arc from the TracPipe system to another conductor. (Doc. No. 75-4, 10/17/12 H. Kytomaa Dep. at 103:16-23). Thus, bonding can help prevent not only the sort of lightning-induced fire that

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<sup>5</sup> The *only* one who claims to have demonstrated that gas from perforations in TracPipe can ignite is Dr. Eagar – and he *admits* that the conditions under which his experiment was performed bear no relationship to the circumstances present at the Kostecki residence. (Doc. No. 53-6, 7/2/12 T. Eagar Dep. at 72:10-15 (agreeing that his test was not “representative of how the fire started in the Kostecki home”).

AAIC hypothesizes, but it can also help prevent lightning-induced fires that have nothing to do with any alleged “defect” in TracPipe or other piping systems by preventing arcing that could ignite combustibles within the structure. This benefit of bonding is even greater where there is an indirect lightning strike (as is the case here), given that direct bonding allows the “tiny, tiny fraction of the lightning energy from the lightning strike that actually makes it to the bonding clamp” to be diverted and “pass through the bonding clamp instead of the CSST.” (*Id.* at 164:24-165:3; 166:10-168:3).

AAIC’s entire argument ignores the fact that Dr. Kytomaa’s opinions were offered in *response* to the opinions offered by AAIC’s expert Dr. Eagar. Far from supporting their position that Dr. Kytomaa’s testimony should have been excluded, AAIC’s motion simply highlights the speculative and unreliable nature of Dr. Eagar’s excluded opinions, and the Court’s undeniably correct rulings with regard to both experts.

### **CONCLUSION**

For the foregoing reasons, Omega Flex respectfully requests that this Court deny AAIC’s motion for a new trial.

Dated: August 28, 2013

**LEWIS, RICE & FINGERSH, L.C.**

By: /s/ Oliver H. Thomas

Neal F. Perryman, #43057MO  
Thomas P. Berra, Jr., #43399MO  
Oliver H. Thomas, #60676MO  
600 Washington Avenue, Suite 2500  
St. Louis, MO 63101  
314.444.7661 (direct)  
314.612.7661 (fax)

**CAMPBELL CAMPBELL EDWARDS &  
CONROY, P.C.**

William J. Conroy (*Pro Hac Vice*)  
Lynne M. O’Brien (*Pro Hac Vice*)  
1205 Westlakes Drive, Suite 330  
Berwyn, PA 19312  
610.964.1900 (phone)  
610.964.1981 (fax)  
*Attorneys for Defendant Omega Flex, Inc.*

**CERTIFICATE OF SERVICE**

I hereby certify on this 28th day of August, 2013, that a copy of the foregoing was filed electronically through the Court's CM/ECF system, with notice of case activity automatically generated and sent electronically to all parties.

Anthony J. Morrone  
Cozen and O'Connor  
333 W. Wacker Drive  
Suite 1900  
Chicago, IL 60606  
312-382-3100  
Email: amorrone@cozen.com

Stephen D. Hoyne  
Stephen D. Hoyne, Attorney at Law  
P.O. Box 210  
St. Louis, MO 63026-0210  
314-306-6399  
Email: stevehoyne@charter.net

*/s/ Oliver H. Thomas*

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Oliver H. Thomas  
Lewis, Rice & Fingersh, L.C.